



October 03, 2016

Meagan E. Ormand Golder Associates Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227

RE: Project: Bremo Monthly Process Pace Project No.: 92314393

# Dear Meagan Ormand:

Enclosed are the analytical results for sample(s) received by the laboratory on September 30, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Micolo Yasiorovske

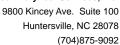
nicole.gasiorowski@pacelabs.com

**Project Manager** 

**Enclosures** 

cc: Ron DiFrancesco, Golder Associates Inc. Martha Smith, Golder Associates Inc. Mike Williams, Golder Associates Inc







### **CERTIFICATIONS**

Project: Bremo Monthly Process

Pace Project No.: 92314393

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165

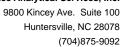
Wyoming Certification: FL NELAC Reciprocity

West Virginia Certification #: 9962C Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

### **Eden Certification IDs**

205 East Meadow Road Suite A, Eden, NC 27288 North Carolina Drinking Water Certification #: 37738 North Carolina Wastewater Certification #: 633 Virginia/VELAP Certification #: 460025



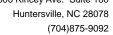


# **SAMPLE ANALYTE COUNT**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92314393001	T4-160928-1242-\$3	ASTM D4282-02	KCE	1	PASI-E
		EPA 200.7	CKJ	8	PASI-O





### **PROJECT NARRATIVE**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Method: ASTM D4282-02
Description: Cyanide, Free

Client: Golder\_Dominion\_Bremo

Date: October 03, 2016

### **General Information:**

1 sample was analyzed for ASTM D4282-02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Additional Comments:**

(704)875-9092



### **PROJECT NARRATIVE**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Method: EPA 200.7
Description: 200.7 MET ICP

Client: Golder\_Dominion\_Bremo

**Date:** October 03, 2016

### **General Information:**

1 sample was analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### **Laboratory Control Spike:**

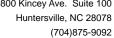
All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.





# **ANALYTICAL RESULTS**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Date: 10/03/2016 04:40 PM

Sample: T4-160928-1242-S3	Lab ID: 923	14393001	Collected: 09/28/1	16 12:42	2 Received: 09	/30/16 13:50	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Cyanide, Free	Analytical Meth	od: ASTM	D4282-02					
Cyanide, Free	ND	mg/L	0.050	1		10/03/16 16:00	57-12-5	
200.7 MET ICP	Analytical Meth	od: EPA 20	00.7 Preparation Met	thod: El	PA 200.7			
Aluminum	ND	ug/L	100	1	10/01/16 14:06	10/03/16 12:3	5 7429-90-5	
Barium	374	ug/L	10.0	1	10/01/16 14:06	10/03/16 12:3	5 7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/01/16 14:06	10/03/16 12:3	5 7440-41-7	
Boron	1460	ug/L	50.0	1	10/01/16 14:06	10/03/16 12:3	5 7440-42-8	
Cobalt	ND	ug/L	10.0	1	10/01/16 14:06	10/03/16 12:3	5 7440-48-4	
Iron	ND	ug/L	250	1	10/01/16 14:06	10/03/16 12:3	5 7439-89-6	
Molybdenum	175	ug/L	10.0	1	10/01/16 14:06	10/03/16 12:3	5 7439-98-7	
Vanadium	ND	ug/L	10.0	1	10/01/16 14:06	10/03/16 12:3	5 7440-62-2	



### **QUALITY CONTROL DATA**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Date: 10/03/2016 04:40 PM

QC Batch: 331565 Analysis Method: ASTM D4282-02

QC Batch Method: ASTM D4282-02 Analysis Description: ASTM D4282 Free Cyanide

Associated Lab Samples: 92314393001

METHOD BLANK: 1837093 Matrix: Water

Associated Lab Samples: 92314393001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Cyanide, Free mg/L ND 0.050 10/03/16 16:00

LABORATORY CONTROL SAMPLE: 1837094

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Cyanide, Free mg/L 0.11 107 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1837095 1837096

MS MSD 92314393001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Cyanide, Free ND 90-110 mg/L .1 .1 0.11 0.11 106 106 0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALITY CONTROL DATA**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Date: 10/03/2016 04:40 PM

QC Batch: 323807 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET

Associated Lab Samples: 92314393001

METHOD BLANK: 1726233 Matrix: Water

Associated Lab Samples: 92314393001

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	100	10/03/16 12:15	
Barium	ug/L	ND	10.0	10/03/16 12:15	
Beryllium	ug/L	ND	1.0	10/03/16 12:15	
Boron	ug/L	ND	50.0	10/03/16 12:15	
Cobalt	ug/L	ND	10.0	10/03/16 12:15	
Iron	ug/L	ND	250	10/03/16 12:15	
Molybdenum	ug/L	ND	10.0	10/03/16 12:15	
Vanadium	ug/L	ND	10.0	10/03/16 12:15	

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	2500	2370	95	85-115	
Barium	ug/L	250	251	100	85-115	
Beryllium	ug/L	25	23.8	95	85-115	
Boron	ug/L	2500	2300	92	85-115	
Cobalt	ug/L	250	253	101	85-115	
Iron	ug/L	2500	2480	99	85-115	
Molybdenum	ug/L	250	244	98	85-115	
Vanadium	ug/L	250	230	92	85-115	

MATRIX SPIKE & MATRIX SF	PIKE DUPLICAT	E: 17262			1726236						
Parameter	352 Units	266808001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Aluminum	ug/L	94.2J	2500	2500	2600	2520	100	97	70-130		
Barium	ug/L	16.6	250	250	274	274	103	103	70-130	0	
Beryllium	ug/L	0.50U	25	25	25.3	24.6	101	99	70-130	3	
Boron	ug/L	32.5J	2500	2500	2480	2410	98	95	70-130	3	
Cobalt	ug/L	5.0U	250	250	261	259	104	104	70-130	1	
Iron	ug/L	0.16 mg/L	2500	2500	2700	2650	101	99	70-130	2	
Molybdenum	ug/L	5.0U	250	250	258	254	103	101	70-130	1	
Vanadium	ug/L	5.0U	250	250	244	234	97	93	70-130	4	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Bremo Monthly Process

Pace Project No.: 92314393

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

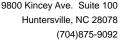
TNI - The NELAC Institute.

# **LABORATORIES**

Date: 10/03/2016 04:40 PM

PASI-E Pace Analytical Services - Eden

PASI-O Pace Analytical Services - Ormond Beach





# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Bremo Monthly Process

Pace Project No.: 92314393

Date: 10/03/2016 04:40 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92314393001	T4-160928-1242-S3	ASTM D4282-02	331565		
92314393001	T4-160928-1242-S3	EPA 200.7	323807	EPA 200.7	323887

# Pace Analytical®

Out of hold, incorrect preservative, out of temp, incorrect containers)

# Document Name: Sample Condition Upon Receipt(SCUR)

Document No.: F-MEC-CS-009-Rev.03 Document Revised: May 24, 2016 Page 1 of 2

Issuing Authority:
Pace Mechanicsville Quality Office

,							Page 2 o	f 2 for Inte	rnal Use ONLY
Sample Condition Upon Client Name:	-			Pro	ject# WO#	: 92	3143	393	
Courier: Fed Ex UPS  Commercial Pace	□USF □Oth		- -	Client	9231439	<b>                                      </b>			
Custody Seal Present? Yes No Seals	Intact?	□Y€	es [	□No	Date/In	itials Person E	Examining Co	ontents: 4	-30-16
	bble Bags	Пи	one	Oth					
Thermometer:	Type of	f Ice:	☑Wet	Blue	None	Sampl	es on ice, co	oling proce	ss has begun
Correction Factor: 0.0°C Cooler Temp Corrected (°C)	-			_	Biological Tissu	ie Frozen?	☐Yes	□No	□N/A
Temp should be above freezing to 6°C  USDA Regulated Soil (  N/A, water sample)									
Did samples originate in a quarantine zone within the United  Yes No	d States: CA	, NY, or 9	SC (check	maps)?	Did samples or including Hawa	aii and Puerto	Rico)? Ye		
	<del></del>				Cor	mments/Disc	repancy:		
Chain of Custody Present?	√Yes	□No	□N/A	1.					
Samples Arrived within Hold Time?	√Yes	□Ņo	□N/A	2.					
Short Hold Time Analysis (<72 hr.)?	Yes	√No	□n/a	3.					
Rush Turn Around Time Requested?	Yes	□No	□N/A	4.					
Sufficient Volume?	Yes	□No	□n/a	5.					
Correct Containers Used?	√Yes	□No	□N/A	6.					
-Pace Containers Used?	✓Yes	□No	□N/A						
Containers Intact?	√Yes	□No	□N/A	7.					
Samples Field Filtered?	□yes	□No	☑N/A	8. 1	lote if sediment is	visible in the	e dissolved o	container	
Sample Labels Match COC?	Yes	□No	□N/A	9.					
-Includes Date/Time/ID/Analysis Matrix: WV	<u> </u>								
All containers needing acid/base preservation have been checked?	Yes		□N/A	10. <sub>HNG</sub>	5 pH<2				
All containers needing preservation are found to be in	[☑] res	□No		нар	nH<2				
compliance with EPA recommendation?	$\overline{}$			HZSC	04 pH<2				
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, Oil and Grease,	√Yes	□No	□n/a	NaOl	H pH>12				
DRO/8015 (water) DOC,LLHg	☐Yes	□No	□Ņ/A	NaOl	H/ZnOAc pH>9				
Samples checked for dechlorination?	□Yes	□No	M/A	11.					
Headspace in VOA Vials (>5-6mm)?	□Yes	□No	□N/A	12.					
Trip Blank Present?	☐Yes	□No	□N/A	13.					
Trip Blank Custody Seals Present?	☐Yes	□No	□N/A	10					
Pace Trip Blank Lot # (if purchased):									
CLIENT NOTIFICATION/RESOLUTION						Field D	ata Require	d? ∐Yes	∐No
Person Contacted:				n	ate/Time:				
Comments/Sample Discrepancy:									•
							, 1		
Project Manager SCURF Review:		NM	MG		Date: _		10/3/1	90	ĸii
Project Manager SRF Review:		N'	MG		Date:	1	013/11	2	
Note: Whenever there is a discrepancy affecting North Carolin				of this for		he North Card	olina DEHNR	Certification	on Office (i.e.

ace Analytical

# CHAIN-OF-CUS OF Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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